

**What is Claimed is:**

1. A composition for detecting and monitoring oxygen in a sample comprising:
  - a) a core comprising at least one oxygen-sensing particle; and
  - b) a hydrophobic coating material surrounding said core.
2. The composition of claim 1, wherein said at least one oxygen-sensing particle is luminescent.
3. The composition of claim 2, wherein said at least one oxygen-sensing particle is selected from the group consisting of a tris-4,7-diphenyl-1,10-phenanthroline ruthenium (II) salt, a tris-2,2'-bipyridyl-ruthenium (II) salt, a tris-1,7-diphenyl-1,10 phenanthroline ruthenium (II) salt, 9,10-diphenyl anthracene, platinum (II) octaethyl porphyrin complexes and palladium (II) octaethyl porphyrin complexes, palladium-meso-tetra(4-carboxyphenyl) porphine, palladium-meso-tetra(4-carboxyphenyl) porphyrin dendrimer and palladium-meso-tetra(4-carboxyphenyl) tetrabenzoporphyrin dendrimer.
4. The composition of claim 3, wherein said tris-4,7-diphenyl-1,10-phenanthroline ruthenium (II) salt is selected from the group consisting of tris-4,7-diphenyl-1,10-phenanthroline ruthenium (II) dichloride pentahydrate, tris-4,7-diphenyl-1,10-phenanthroline ruthenium (III) trichloride, tris-4,7-diphenyl-1,10-phenanthroline ruthenium (II) diperchlorate and tris-4,7-diphenyl-1,10-phenanthroline ruthenium hexafluorophosphate.
5. The composition of claim 3, wherein said tris-2,2'-bipyridyl-ruthenium (II) salt is tris-2,2'-bipyridyl-ruthenium (II) chloride hexahydrate.

6. The composition of claim 3, wherein said salt of tris-1,7-diphenyl-1,10 phenanthroline ruthenium (II) is tris-1,7-diphenyl-1,10 phenanthroline ruthenium (II) dichloride.
7. The composition of claim 1, wherein said hydrophobic coating material comprises a polymer.
8. The composition of claim 7, wherein said polymer is selected from the group consisting of a functionalized polydimethylsiloxane, silicone rubber, polytetrafluoroethylene (PTFE), polystyrene, and mineral oil.
9. The composition of claim 8, wherein said functional polydimethylsiloxane is selected from the group consisting of vinyl functionalized polydimethylsiloxanes, hydrido functionalized polydimethylsiloxanes, alkoxy functionalized polydimethylsiloxanes and acetoxyl functionalized polydimethylsiloxanes.
10. The composition of claim 1, wherein said core further comprises a carrier molecule.
11. The composition of claim 10, wherein said carrier molecule is selected from the group consisting of silica and polystyrene.
12. The composition of claim 1, further comprising at least one additional coating around said hydrophobic coating material, wherein said at least one additional coating encapsulates said hydrophobic coating material.
13. The composition of claim 12, wherein said at least one additional coating is hydrophilic or hydrophobic.
14. The composition of claim 1, further comprising a matrix.

15. The composition of claim 14, wherein said matrix is suitable for cell culturing.
16. The composition of claim 15, wherein said matrix is a three-dimensional matrix.
17. The composition of claim 16, wherein said three-dimensional matrix is a hydrogel matrix.
18. The composition of claim 17, wherein said hydrogel is selected from the group consisting of ionically crosslinked agarose, ionically crosslinked alginate, modified alginate hyaluronic acid, modified hyaluronic acid, polyacrylimide, polyethylene glucose (PEG), polyvinylalcohol (PVA), poly methylmethacrylate (PMMA), collagen and combinations thereof.
19. A method of detecting the oxygen content in a sample for at least one time point, comprising the composition of claim 1.
20. The method of claim 19, wherein said at least one time point comprises a first and second time point.
21. The method of claim 20, further comprising comparing said detected levels at said first and second time points.
22. A method of making the composition of claim 1, comprising:
  - a) dispersing said oxygen-sensing particle in a liquid, wherein said oxygen-sensing particle does not dissolve in said liquid;
  - b) dispersing said hydrophobic coating material in said liquid;

- c) agitating said liquid that contains said oxygen-sensing particle and said hydrophobic coating material;
  - d) removing said liquid after said agitation; and
  - e) drying the resulting powder after said liquid removal.
23. The method of claim 22, further comprising a carrier molecule.
24. A method of detecting the oxygen content in a sample for at least one time point, comprising the composition of claim 16.
25. The method of claim 24, wherein said at least one time point comprises a first and second time point.
26. The method of claim 25, further comprising comparing said detected levels at said first and second time points.
27. A method of screening the cellular metabolic effect of a compound comprising the compound of claim 1.
28. A method of screening the cellular metabolic effect of a compound comprising the compound of claim 16.